: 4150-31)

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Office of the Secretary

Findings of Research Misconduct

AGENCY: Office of the Secretary, HHS

ACTION: Notice.

SUMMARY: Findings of research misconduct have been made against Alice C. Chang, Ph.D. (formerly named Chun-Ju Chang) (Respondent), who was an Associate Professor of Basic Medical Sciences, College of Veterinary Medicine, Purdue University (PU). Respondent engaged in research misconduct in research supported by U.S. Public Health Service (PHS) funds, specifically National Cancer Institute (NCI), National Institutes of Health (NIH), grants P30 CA023168 and R37 CA215087. The administrative actions, including debarment for a period of ten (10) years, were implemented beginning on December 7, 2022, and are detailed below.

FOR FURTHER INFORMATION CONTACT:

Wanda K. Jones, Dr.P.H.
Acting Director
Office of Research Integrity
1101 Wootton Parkway, Suite 240
Rockville, MD 20852
(240) 453-8200

SUPPLEMENTARY INFORMATION: Notice is hereby given that the Office of Research Integrity (ORI) has taken final action in the following case:

Alice C. Chang, Ph.D., Purdue University: Based on the report of an investigation conducted by PU and additional analysis conducted by ORI in its oversight review, ORI found that Dr. Alice C. Chang (formerly named Chun-Ju Chang), former Associate Professor of Basic Medical Sciences, College of Veterinary Medicine, PU, engaged in research misconduct in research supported by U.S. Public Health Service (PHS) funds, specifically National Cancer Institute (NCI), National Institutes of Health (NIH), grants P30 CA023168 and R37 CA215087.

ORI found that Respondent engaged in research misconduct by knowingly, intentionally, or recklessly falsifying and/or fabricating data included in the following sixteen (16) grant applications submitted for PHS funds:

- R21 CA191797-01, "Targeting miR-200c for early detection of aggressive breast cancer," submitted to NCI, NIH, on 02/17/2014
- R21 CA194474-01, "The role of miRNA regulated-cell polarity machinery in breast cancer stem cell fate decision," submitted to NCI, NIH, on 06/19/2014
- R03 CA198606-01, "Targeting cell polarity machinery to exhaust breast cancer stem cell pool," submitted to NCI, NIH, on 10/28/2014 (funded)
- R01 CA205940-01, "Epigenetic regulation governing ATRA-mediated cellular programming," submitted to NCI, NIH, on 06/04/2015
- R01 CA208325-01, "Epigenetic mechanism underlying retinoic acid resistance in breast cancer stem cells," submitted to NCI, NIH, on 10/05/2015
- R01 CA208325-01A1, "Epigenetic mechanism underlying retinoic acid resistance in tumor stem cells," submitted to NCI, NIH, on 11/07/2016
- R21 CA215908-01, "Targeting EMT-induced mitochondrial heterogeneity in breast cancer," submitted to NCI, NIH, on 06/24/2016

- R01 CA211063-01, “The role of mitochondrial regulation in directing the cancer stem cell fate,” submitted to NCI, NIH, on 01/28/2016
- R01 CA215087-01, “Targeting metformin-directed stem cell fate in triple negative breast cancer,” submitted to NCI, NIH, on 06/03/2016
- R37 CA215087-01A1, “Targeting metformin-directed stem cell fate in triple negative breast cancer,” submitted to NCI, NIH, on 03/06/2017 (funded)
- R01 CA226951-01, “(PQ11) Role of DHA in directing luminal differentiation and therapy response in triple-negative breast cancer,” submitted to NCI, NIH, on 06/22/2017
- R01 CA231940-01, “Regulation of Tet2 in programming mammary stem cell fate,” submitted to NCI, NIH, on 10/05/2017
- R01 CA231940-01A1, “Regulation of Tet2 in programming mammary stem cell fate,” submitted to NCI, NIH, on 06/26/2018
- R01 CA233941-01, “DHA directs epigenetic programming in triple-negative breast cancer,” submitted to NCI, NIH, on 02/05/2018
- R01 GM121775-01, “The role of Tet2 regulation in directing mammary stem cell fate,” submitted to the National Institute of General Medical Sciences (NIGMS), NIH, on 02/05/2016
- R35 GM124972-01, “Novel role of microRNA in directing stem cell fate decision,” submitted to NIGMS, NIH, on 11/04/2016

Specifically, ORI found that Respondent knowingly, intentionally, or recklessly falsified and/or fabricated data from the same mouse models or cell lines by reusing the data, with or without manipulation, to represent unrelated experiments from different mouse models or cell lines with different treatments in three hundred eighty-four (384) figure panels in sixteen (16) grant applications.

In addition, ORI found that Respondent engaged in research misconduct by knowingly, intentionally, or recklessly falsifying and/or fabricating data included in two (2) PHS-supported published papers. Respondent neither admits nor denies ORI's findings with respect to the two (2) published papers:

- Chang CC, Wu MJ, Yang JY, Camarillo IG, Chang CJ. Leptin-STAT3-G9a signaling promotes obesity-mediated breast cancer progression. *Cancer Res*. 2015 Jun 1;75(11):2375-86. doi: 10.1158/0008-5472.CAN-14-3076.
- Wu MJ, Kim MR, Chen YS, Yang JY, Chang CJ. Retinoic acid directs breast cancer cell state changes through regulation of TET2-PKCζ pathway. *Oncogene* 2017 Jun 1;36(22):3193-206. doi: 10.1038/onc.2016.467.

Specifically, ORI found that Respondent intentionally, knowingly, or recklessly falsified and/or fabricated:

- confocal image data for generation, differentiation, and drug sensitivity of cancer stem cells (CSC) in mouse models and cell lines by reusing the data, with or without manipulation, and relabeling them to represent different experiments in fifty-four (54) figure panels included in fifteen (15) grant applications
- Western blot and co-IP blot images for different protein expression in different mouse models and cell lines by reusing the images, with or without manipulation, and relabeling them to represent different experiments in eighty-one (81) figure panels in thirteen (13) grant applications
- figures, charts, and graphs reporting gene expression related results for the global or tissue-related gene expression in mouse models and cell lines with drug treatments by reusing them, with or without manipulation, and relabeling them to represent different experiments in one hundred nineteen (119) figure panels in fifteen (15) grant applications and two (2) published papers

- figures, charts, and graphs about cellular experiment related results for different mouse models and cell lines by reusing them, with or without manipulation, and relabeling them to represent different experiments in forty-two (42) figure panels in thirteen (13) grant applications
- photomicrographs for different results from different mouse models and cell lines by reusing them, with or without manipulation, and relabeling them to represent different experiments in eighty-five (85) figure panels in fifteen (15) grant applications
- CSC frequency (xenograft tumor formation) data reporting different results from either mouse models or cell lines by reusing and relabeling the same data to represent different experiments in three (3) figure panels in three (3) grant applications

Dr. Chang entered into a Voluntary Exclusion Agreement (Agreement) and voluntarily agreed to the following:

(1) Respondent will exclude herself voluntarily for a period of ten (10) years beginning on December 7, 2022 (the "Exclusion Period") from any contracting or subcontracting with any agency of the United States Government and from eligibility for or involvement in nonprocurement or procurement transactions referred to as "covered transactions" in 2 CFR parts 180 and 376 (collectively the "Debarment Regulations").

(2) During the Exclusion Period, Respondent will exclude herself voluntarily from serving in any advisory or consultant capacity to PHS including, but not limited to, service on any PHS advisory committee, board, and/or peer review committee.

(3) Respondent will request that the following papers be corrected:

- *Cancer Res*. 2015 Jun 1; 75(11):2375-86
- *Oncogene* 2017 Jun 1; 36(22):3193-206

Respondent will copy ORI and the Research Integrity Officer at PU on the correspondence with the journal(s).

Dated: December 13, 2022.

Wanda K. Jones,

Acting Director, Office of Research Integrity,

Office of the Assistant Secretary for Health.

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